A.6: Up-gradation of Radiation Monitoring Control System (RMCS) for Indus-1

Indus-1 Radiation Monitoring Control System interfaces Radiation Monitors (RMs) in Indus-1 premises to remotely display the electromagnetic radiation level, measured by the RMs. RMCS provides monitoring of RMs while no control actions are presently foreseen. It displays radiation levels from analog signals & alarms status from digital signals of radiation monitors. Existing RMCS has been working since nineties. It had incrementally evolved to meet different system requirements in course of time. Many new RMs (planned for Indus complex) were also required to be added in RMCS. Hence a control system upgrade was planned to accommodate more RMs and have improved technology in terms of hardware & software along with easier integration with evolving Indus control systems. Some of the new features include analog signal interface with channel to channel isolation in hardware, faster, network based communication with Equipment Controller (EC), WinCC OA (previously known as PVSS) SCADA based software etc.

Architecture of new RMCS system:

New RMCS has two layered architecture as shown in Fig.A.6.1. It uses VME bus based Equipment Controller (EC) connected over 100 Mbps ethernet to SCADA system. The Equipment Control Station (ECS) comprises EC having VME CPU, Analog and Digital Input VME cards in 6U VME sub-rack along with field signal interfacing electronics. The CPU (MVME-162) runs Real Time Operating System OS-9. The EC & SCADA software work in Command-Response manner.

Implementation & Functionality:

New RMCS can accommodate 30 RMs. Each RM has 4 digital status & one analog (corresponds to radiation value) signal. Status signals in the form of potential free contacts are interfaced via Digital Input card. Analog signals are in 4-20 mA current loops. Analog inputs are given to 12 bit ISOADC card via isolation amplifier to avoid noise interference due to common-ground situation. Monitors from four different areas like M/B (Microtron/Booster), I/T2 (Indus-1/TL2), TL3 and IEXH (I1- Experimental Hall) are planned to be connected to RMCS. Presently 13 monitors are connected as shown in Fig.A.6.2.

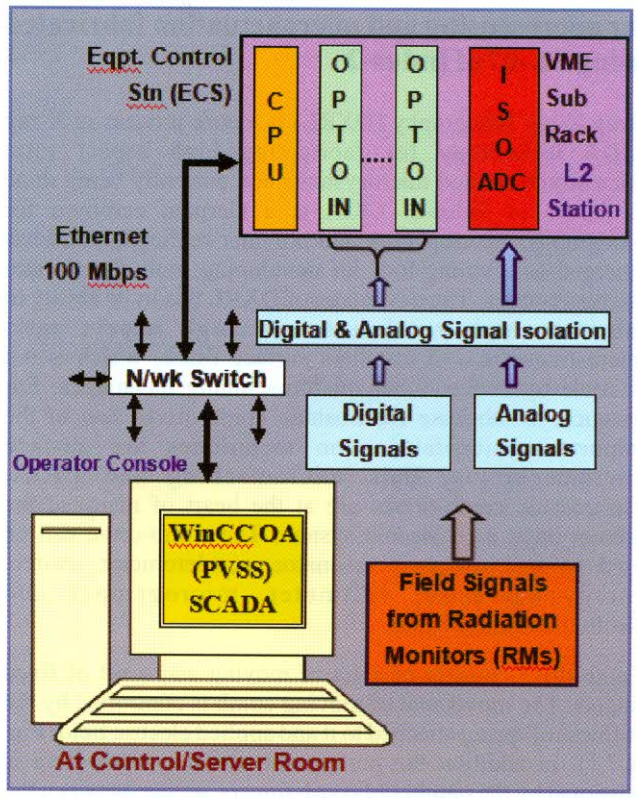

Fig. A.6.1: Schematic of new RMCS for Indus-1

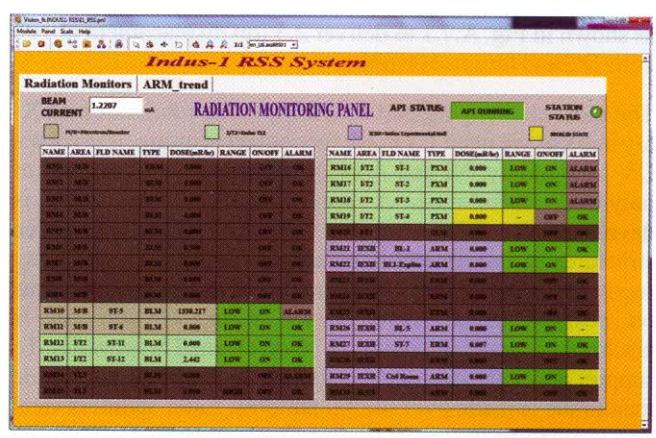

Fig.A.6.2: GUI panel of new RMCS for Indus-1

Colored rows represent the connected RMs (grayed are the ones not yet connected). History data, stored in SQL data base, can be queried over web. The system is installed in Indus and commissioned for regular operation.

Reported by:
Sampa (sampa@rrcat.gov.in), R. Mishra, P. Fatnani